REMARKS

- Claims 1, 7, 19, and 23-25 have been amended.
- Claims 3, 15, 26, 27, 31-35 have been cancelled without prejudice.
- Claims 1, 36, and 44 are in independent format.

Applicant wishes to thank the Examiner for the time spent during the brief telephone interview with Applicant's representative Mr. Mark E. Books on October 18, 2007. During the interview the teachings of the '918 *Downing* reference were discussed and distinguished from the present invention, as set forth in the present claims and remarks below.

1. Rejections Under 35 U.S.C. § 102(b)

A. Claims 1, 7, 9, 10, 14, 19, 23-15, 30, 36-39, 44, 49, and 61

The Examiner's rejection of Claims 1, 7, 9, 10, 14, 19, 23-15, 30, 36-39, 44, 49, and 61 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,054,918 to *Downing* is respectfully traversed.

In particular, the '918 *Downing* reference fails to anticipate at least each of the independent Claims 1, 36, and 44 because it fails to show a vehicle wheel balancer configured, as required by the amended claims, to acquire two-dimensional images of a three-dimensional *surface region* or *surface area* of a vehicle wheel rim. Rather, the '918 *Downing* reference is directed towards an apparatus for determining a linear surface contour or single-plane representation (profile) of a work piece using a planar

light beam which is scanned across the wheel surface along a single line. (Fig. 10; Col. 1, lines 30-43).

i. Claim 1

Claim 1 as amended requires a wheel balancing system to include an imaging sensor assembly and a central processing unit. The imaging sensor assembly is disposed to acquire at least one optical image of a three-dimensional surface region of the vehicle wheel rim, such that the acquired optical image consists of a two dimensional array of pixel elements representing said three-dimensional surface region. Correspondingly, the central processing unit is configured to utilize, during a wheel imbalance service procedure, a distance measurement identified from a two-dimensional optical image of the vehicle wheel rim surface region acquired by the imaging sensor assembly.

In contrast, the '918 *Downing* patent fails to show a vehicle wheel balancer system having an imaging sensor assembly and associated central processor configured to utilize, during a wheel imbalance service procedure, images of a three-dimensional surface region of the vehicle wheel rim acquired by the imaging sensor assembly. Rather, the '918 *Downing* patent teaches a system for projecting a line or stripe of light onto a wheel, and processing an acquired image of the projected line or stripe to identify distortions therein corresponding to the linear cross-sectional profile of the surface onto which the line or stripe has been projected. (Col. 6, lines 42 – 68). The processing system of the '918 *Downing* patent is not configured to acquire or process an image of a three-dimensional region or area on the surface of a vehicle wheel rim,

but rather, is limited to a linear profile or contour. Accordingly, the '918 *Downing* patent fails to anticipate each and every required limitation of Claim 1 under 35 U.S.C. § 102(b).

ii. Claim 36

Claim 36 of the present application sets forth an improved wheel parameter measurement apparatus for a dynamic wheel balancer which includes both an optical energy sensing means and a processing means. The sensing means is configured for receiving reflected optical energy from an area of the vehicle wheel rim on the spindle, and for generating a two-dimensional image of the detected optical energy. The processing means is correspondingly configured for receiving images generated by the optical energy sensing means and to extract data from the images which relates to at least one feature of the wheel rim in the surface area.

In contrast to Claim 36, the '918 *Downing* patent fails to show a vehicle wheel balancer system having a sensing means and a processing means configured as required by Claim 36. Rather, the '918 *Downing* patent teaches a system for projecting a line or stripe of light onto a wheel, and processing an acquired image of the projected line or stripe to identify distortions therein corresponding to the linear cross-sectional profile of the surface onto which the line or stripe has been projected. (Col. 6, lines 42 – 68). The imaging system of the '918 *Downing* patent is not configured to acquire or process an image of a three-dimensional area on the surface of a vehicle wheel rim, but rather, is limited to a linear profile or contour. Accordingly, the '918 *Downing* patent fails to anticipate each and every required limitation of Claim 36 under 35 U.S.C. § 102(b).

iii. Claim 44

Claim 44 of the present application sets forth a method for characterizing a feature of a vehicle wheel assembly consisting of at least a vehicle wheel rim, where the vehicle wheel assembly is mounted for rotational movement about an axis on a vehicle wheel balancer system. The method of Claim 44 requires the steps of (1) detecting reflected optical energy from a three-dimensional *area* of the vehicle wheel rim; (2) generating a two-dimensional image composed of a plurality of image pixels which are representative of the three-dimensional surface area of the vehicle wheel rim from the detected optical energy; (3) processing the generated image to extract data associated with at least one feature of the vehicle wheel rim surface area; and (4) utilizing the extracted data during a wheel imbalance service procedure.

In contrast to Claim 44, the '918 *Downing* patent fails to show a method for characterizing a feature of a vehicle wheel assembly mounted on a vehicle wheel balancer system, and furthermore, fails to show at least the steps of detecting reflected optical energy from a three-dimensional *area* of a wheel rim and of generating an image of a *area*. Rather, the '918 *Downing* patent is limited to teaching the detection of linear or planar light reflected from a wheel rim profile or contour, to generate a representation of that linear profile or contour. The generated representation or image does not correspond to a surface region or area of the vehicle wheel rim, but rather, is limited to just the illuminated profile or contour onto which the linear or planar light is projected. Accordingly, the '918 *Downing* patent fails to anticipate each and every required step of Claim 44 under 35 U.S.C. § 102(b).

iv. Dependent Claims

Dependent Claims 2, 7, 9, 10, 14, 17, 19, 23-25, 30, 37-39, 49, and 61 each depend either directly or indirectly from one of the independent claims discussed above, and accordingly, are each seen as allowable over the '918 *Downing* patent under 35 U.S.C. § 102(b) for at least the same reasons as their respective parent claim.

2. Rejections Under 35 U.S.C. § 103(a)

A. Claim 17

The rejection of Claim 17 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,054,918 to *Downing* in view of U.S. Patent No. 4,723,445 to *Ripley* is respectfully traversed. With respect to Claim 17, the Examiner's stated basis for the rejection is that the '918 *Downing* reference discloses the system of Claim 17 but does not show wheel features to be spoke configurations or spoke profiles. Accordingly, the Examiner relies upon the disclosure of the '445 *Ripley* reference to show wheel spoke configurations and profiles, and contends that it would have been obvious to modify the teachings of the '918 *Downing* reference with the teachings of the '445 *Ripley* reference as determination of such features is necessary when balancing a wheel.

The subject matter of the '445 *Ripley* reference is extremely distant from the field of vehicle wheel balancing. The '445 *Ripley* reference is directed towards a vehicle wheel and tire pressure monitor. The passages cited by the Examiner at Col. 2, lines 27-47 describe the physical characteristics of a vehicle wheel, and indicate that wheels have spokes. This is a statement of general background fact, and does not teach or

suggest any need to determine the configuration or profile of wheel spokes. One of ordinary skill in a vehicle wheel balancing field would not have any motivation to look to the teachings of a tire pressure monitoring apparatus for use in connection with an optical imaging vehicle wheel service system such as the '918 *Downing* reference. Furthermore, the Examiner's statement that it "would have been obvious to modify *Downing* to include features to be spoke configuration or spoke profiles *because these features are necessary when determining the balance of a wheel*" is in error. It is not necessary to have any knowledge of wheel spoke configuration, profile, or placement when determining the imbalance of a vehicle wheel.

In summary, the '918 *Downing* reference teaches the use of a planar light beam to acquire a linear profile image of wheel assembly. The '445 *Ripley* reference teaches a tire pressure monitor for use with a vehicle wheel having spokes. The combination of these references in the manner described by the Examiner completely fails to teach or suggest the limitations of Claim 17, as none of these references alone or in combination, suggests to one of ordinary skill in the art a system which identifies either a wheel spoke configuration or a wheel spoke profile using data acquired from two-dimensional images of three-dimensional wheel rim surface regions. Accordingly Claim 17 is seen as allowable under 35 U.S.C. § 103(a) in view of the cited references.

3. Conclusion

If for any reason the Examiner is unable to allow the application on the next Office Action and feels that an interview would be helpful to resolve any issues, the

Examiner is respectfully requested to contact the undersigned attorney for the purpose of arranging such an interview.

Respectfully submitted,

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